## AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1-13 (canceled).

14. (new): A method of processing signals received corresponding to a signal emitted comprising by recurrence two pulses, a Doppler tolerant broadband pulse and a Doppler intolerant broadband pulse, said method comprising:

detecting objects performed on the part of the signal received corresponding to the first pulses and providing an alarm for each object detected, and

classifying the objects detected ;

wherein said classification of the objects detected is performed on the part of the signal received corresponding to the Doppler intolerant pulses for the alarms satisfying at least one predetermined criterion.

15. (new): The method of processing signals as claimed in claim 14, wherein the predetermined criterion applied to the alarms comprises a comparison of the alarms with a predetermined threshold.

16. (new): The method of processing signals as claimed in claim 15, further comprising a step of first matched filtering of the part of the signal received corresponding to the Doppler tolerant pulses before the detection of objects providing an energy $E_{HFM}(v,t)$.

17. (new): The method of processing signals as claimed in claim 16, wherein the first matched filtering comprises:

correlating the part of the signal received corresponding to the Doppler tolerant pulses,

a step of rms detection of the correlated signal providing signals representing the energy as a function of channel and time $E_{HFM}(v,t)$.

18. (new): The method of processing signals as claimed in claim 14, wherein said step of detecting objects comprises:

searching for the local energy maxima $E_{HFM}(v,t)$ by comparison with a predetermined energy threshold $E_s$,

normalizing the maxima obtained by calculation for each local maxima of the value $(E_{HFM}-M)/\sigma$, M being the mean of the reference noise and $\sigma$ the corresponding standard deviation,

eliminating the maxima of lower normed energy,

selecting the alarms corresponding to normed maxima not eliminated greater than a predetermined threshold of normed energy $E_{SN}$.

19. (new): The method of processing signals as claimed in claim 17, wherein said step of detecting objects comprises:

searching for the local energy maxima $E_{HFM}(v,t)$ by comparison with a predetermined energy threshold $E_s$,

normalizing the maxima obtained by calculation for each local maxima of the value $(E_{HFM}-M)/\sigma$, M being the mean of the reference noise and $\sigma$ the corresponding standard deviation,

eliminating the maxima of lower normed energy,

selecting the alarms corresponding to normed maxima not eliminated greater than a predetermined threshold of normed energy $E_{SN}$.

20. (new): The method of processing signals as claimed in claim 14, further comprising a step of estimating Doppler $d_i$ of the alarms i corresponding to the Doppler intolerant pulses for the alarms satisfying at least one predetermined criterion, and/or the associated standard deviations $\sigma_{d_i}$.

21. (new): The method of processing signals as claimed in claim 20, wherein the inherent Doppler is estimated at each instant:

either on the basis of a Doppler of the part of the signal received corresponding to the reverberation of the Doppler intolerant pulses,

or on the basis of the spectrum of the reverberation of the part of the signal received corresponding to the pulses FP when pulses FP have been emitted.

22. (new): A method of processing signals received corresponding to a signal emitted comprising by recurrence two pulses, a Doppler tolerant broadband pulse and a Doppler intolerant broadband pulse, said method comprising

forming a first channel comprising the part of the signal received corresponding to the Doppler tolerant pulses, and a second channel comprising part of the signal received corresponding to the Doppler intolerant pulses,

first matched filtering of the first channel before the detection of objects,

detecting the objects providing an alarm for each object detected,

selecting the alarms satisfying at least the predetermined criterion in the second channel,

second matched filtering of the second channel around the alarms selected,

Doppler estimation of the alarms selected in the second channel,

estimating inherent Doppler,

the classifying of the objects by discrimination between the bottom echoes and the true echoes on the basis of the values of the Doppler of the alarms selected in the second channel and of the inherent Doppler,

eliminating on the first channel the alarms detected corresponding to bottom echoes.

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23. (new): The method of processing as claimed in claim 22, using jointly signals coming from a pulse of HFM type, and coming from a pulse of BPSK type, the two pulses being emitted in the same recurrence.

24. (new): An active sonar comprising,

means of emitting a signal comprising by recurrence two pulses, a Doppler tolerant broadband pulse and a Doppler intolerant broadband pulse, and

means of receiving the signal emitted implementing the method of processing signals as claimed in claim 23.

25. (new): The active sonar as claimed in claim 11, wherein the means of emission emit the two pulses at different instants with totally or partly overlapping frequency bands.

26. (new): The active sonar as claimed in claim 11, wherein the means of emission emit the two pulses simultaneously with distinct frequency bands.